

WHAT ARE CLAIMED ARE:

1. A background noise eliminating apparatus, comprising:
  - an envelope detector that detects an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;
  - 5 a section detector that detects a section during which a slope of the envelope detected by said envelope detector takes a value in a predetermined range including "0" during a predetermined time or longer;
  - a determining device that determines a background noise component value in accordance with sample data of the impulse response waveform during the section detected by said section detector; and
  - 10 a background noise component eliminator that reduces an absolute value of the sample data of the impulse response waveform by the background noise component value determined by said determining device.
- 15 2. A background noise eliminating apparatus, comprising:
  - an envelope detector that detects an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;
  - 20 a section detector that detects a section during which a slope of the envelope detected by said envelope detector takes a value in a predetermined range including "0" during a predetermined time or longer;
  - a subtracting device that determines a DC offset component value in accordance with sample data of the impulse response waveform during the section detected by said section detector, and subtracts the DC offset component value from the sample data of the impulse response waveform;
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a determining device that determines a background noise component value in accordance with the sample data, during the section detected by said section detector, of the impulse response waveform reduced by the DC offset component value by said subtracting device; and

5 a background noise component eliminator that reduces an absolute value of the sample data of the impulse response waveform subtracted by said subtracting device by the DC offset component value, by the background noise component value determined by said determining device.

10 3. A background noise eliminating apparatus according to claim 1, wherein said determining device determines a value of a maximum sample data having a largest absolute value among the sample data of the impulse response waveform during the section detected by said section detector, as the background noise component value.

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4. A background noise eliminating apparatus, comprising:  
envelope detecting means for detecting an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;

20 section detecting means for detecting a section during which a slope of the envelope detected by said envelope detecting means takes a value in a predetermined range including "0" during a predetermined time or longer;

determining means for determining a background noise component value in accordance with sample data of the impulse response waveform during  
25 the section detected by said section detecting means; and

background noise component eliminating means for reducing an

absolute value of the sample data of the impulse response waveform by the background noise component value determined by said determining means.

5. A background noise eliminating apparatus, comprising:

5 envelope detecting means for detecting an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;

section detecting means for detecting a section during which a slope of the envelope detected by said envelope detecting means takes a value in a  
10 predetermined range including "0" during a predetermined time or longer;

subtracting means for determining a DC offset component value in accordance with sample data of the impulse response waveform during the section detected by said section detecting means, and subtracting the DC offset component value from the sample data of the impulse response waveform;

15 determining means for determining a background noise component value in accordance with the sample data, during the section detected by said section detecting means, of the impulse response waveform reduced by the DC offset component value by said subtracting means; and

background noise component eliminating means for reducing an  
20 absolute value of the sample data of the impulse response waveform subtracted by said subtracting means by the DC offset component value, by the background noise component value determined by said determining means.

6. A background noise eliminating apparatus according to claim 1,

25 wherein said determining means determines a value of a maximum sample data having a largest absolute value among the sample data of the impulse response

waveform during the section detected by said section detecting means, as the background noise component value.

7. A background noise eliminating method, comprising the steps of:

5 (a) detecting an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;

(b) detecting a section during which a slope of the envelope detected by said step (a) takes a value in a predetermined range including "0" during a predetermined time or longer;

10 (c) determining a background noise component value in accordance with sample data of the impulse response waveform during the section detected by said step (b); and

(d) reducing an absolute value of the sample data of the impulse response waveform by the background noise component value determined by said  
15 step (c).

8. A storage medium storing a program, which a computer executes to realize a background noise eliminating process, comprising the instructions of:

20 (a) detecting an envelope of an impulse response waveform from a sample data sequence of the impulse response waveform;

(b) detecting a section during which a slope of the envelope detected by said instruction (a) takes a value in a predetermined range including "0" during a predetermined time or longer;

(c) determining a background noise component value in accordance  
25 with sample data of the impulse response waveform during the section detected by said instruction (b); and

